

Utah Department of Agriculture and Food

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Division of Plant Industry 2005 Insect Report

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Protecting Utah's Agriculture

Introduction

In the absence of pest management, harmful insects could seriously cripple Utah's billion dollar a year agricultural industry. The future of Utah's food production environment depends upon effective control of damaging insects by producers and governmental agencies.

The Emergency Insect Program began in 1985 with the enactment of the Insect Infestation Emergency Control Act (Chapter 35, Utah Code). The following information highlights the major insect programs conducted by the Utah Department of Agriculture and Food, Division of Plant Industry.

The Utah Department of Agriculture and Food, Division of Plant Industry is helping producers in the state to control harmful insects and other agricultural and public nuisance pests by: (1) establishing insectories to rear natural predators for distribution; (2) trapping and monitoring insect movement, and (3) supporting research for better control methods that can be used in pest management programs.

We hope that you will find this publication to be informative and useful with regards to the insects that threaten the quality and viability of Utah's agricultural economy and environment.

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African Honey Bee Detection Program

Public Health Threat/ Economic Pest

2005 Survey Program

The African honey bee (*Aphis mellifera scutellata*) was unfortunately released in Brazil in 1956. Since then, it has migrated steadily northward, towards the United States. Since it was first discovered in the U.S. in 1990, the African honey bee has migrated into Arizona, Nevada, New Mexico, Texas and Southern California. Based upon experiences in Mexico and Texas, the northward migration of the African honey bee cannot be stopped.

Counties with Detection Traps



The African honey bee is a serious threat to the beekeeping industry because its aggressive behavior will displace domestic honey bees and compete for resources. Utah's beekeeping industry produced \$2.6 million dollars worth of honey in 2005.

The African honey bee will always represent a public health threat because it tends to sting more readily and in greater numbers than does the domestic honey bee.

Rather than imposing additional regulations, the Utah Department of Agriculture and Food along with Utah's beekeeping industry will approach the problem with surveys with early detection, management, and education of beekeepers and others involved with the program.

The Utah Department of Agriculture and Food has put into action a detection program in the southern portion of the state consisting of 125 detection traps. There were no confirmed detections of African honey bees in Utah during 2005 from the survey.

Action Plan for 2006

The African honey bee is a serious threat to Utah's beekeeping industry, and is also a public health threat. In 2006 UDAF plans to continue detection trapping of the African honey bee to determine if it has migrated into the state. UDAF will also continue to conduct education and outreach on issues concerning the African honey bee to the public and the beekeeping community.

Apple Maggot / Cherry Fruit Fly Survey Program

Quarantine Pest

2005 Survey Program

The apple maggot (*Rhagoletis pomonella*), also known as the "railroad- worm", is a picture-wing fly native to North America. The cherry fruit fly (*Rhagoletis indifferens*), is also native to North America. It is blackish in color with tinges of yellow on the head and lateral margins of the thorax. Both insects have become a major pest of fruit trees in the U.S. and Canada.

Fruit marketed for export must be free from all apple maggot and cherry fruit fly injury. Therefore, thorough and effective control measures are necessary. There are more than 300 commercial fruit growers in Utah, with a commercial value of more than 27 million dollars annually. With Utah's apple maggot and cherry fruit fly program in place, fruit growers in Utah are able to export fruit to states that have quarantines, against these pests. *All western states have apple maggot and cherry fruit fly quarantines.*

The Apple Maggot Program began in 1985 with the discovery of the apple maggot fly in Utah County; it has been subsequently amended to include cherry fruit fly detection and control. The program provides commercial growers with information that helps with better timing for insecticide spraying. Accurately timed sprays result in fewer insecticides being used with less harm to the environment and lower production costs. Without proper control, these insects could cause serious damage to all tree fruit grown in the state.

Apple maggot catches have decreased from over 60 in 1994 to less than 10 in 2002 and 0 in 2005. UDAF employees monitor approximately 600 insect traps during the growing season. *No apple maggots have been found in commercial orchards. All apple maggot catches have been in abandoned or non-commercial orchards.*

Action Plan for 2006

UDAF plans to continue its detection trapping program in 2006, providing commercial fruit growers with vital information to prevent apple maggots and cherry fruit flies from spreading and affecting the quality and marketability of Utah's commercially grown fruit.

Cereal Leaf Beetle Survey Program

Quarantine Pest

2005 Survey Program

The cereal leaf beetle (*Ouleama melanoplus*) is a small, metallic blue and red beetle. It originated in Europe, and was first identified in the U.S. in 1962.

Both the larva and adult feed on the leaves of small grains, such as barley and oats. The cereal leaf beetle has the potential to seriously damage crops, reducing harvests by 75%. For this reason, domestic grain markets require fumigation of grain or guaranteed insect free shipments to prevent the spread of the cereal leaf beetle. *Many western states have a quarantine in place for the cereal leaf beetle, including Arizona, California, and Nevada*

Cereal Leaf Beetle Detection Sites 2005



By the late 1970's, the insect had spread to all parts of the Midwest and Northeast, found in DE, IL, IN, KY, MD, MA, MI, NJ, NY, OH, PA, TN, VT, VA, WV, and WI. In addition, current NAPIS records show that it has been found in AL, AR, GA, IA, ID, KS, ME, MS, MT, NC, SC, UT, VT, and WY.

Small grains and field crops represent Utah's greatest agricultural strength, with a 2005 total production value over 500 million dollars.

The cereal leaf beetle was first identified in Utah in 1984. Now 9 of Utah's agricultural counties, including the nine northernmost counties, have cereal leaf beetle.

The Utah Department of Agriculture and Food conducts an annual survey in cooperation with Utah State University to determine the range and density of the cereal leaf beetle population. A cooperative insectory program to produce natural predators of the cereal leaf beetle has been undertaken by UDAF, APHIS, and USU. Investigations into the effects of biological controls of cereal leaf beetles are underway in Cache, and Davis counties. Initial results indicate that biological control has the potential to reduce the cereal leaf beetle population by 75%.

Action Plan for 2006

The cereal leaf beetle presents a serious threat to Utah's agricultural industry. UDAF will continue its program of survey trapping of this quarantined insect. UDAF will also continue to provide funding and expertise to the cooperative insectory program to produce biological controls of the beetle. Phytosanitary certification is necessary to continue export of hay and grain to other states and countries.

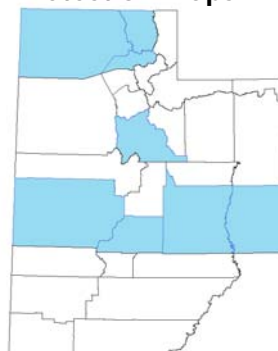
European Corn Borer Detection Program

Quarantine Pest

2005 Survey Program

Utah has a quarantine (R68-10) in position for manufactured goods that may contain the European corn borer in order to prevent this destructive insect from entering the state. A state trapping program is launched every year in chief corn producing areas for this grave pest. In 2005, 81 traps were positioned in six counties. All through its early history in the United States, the European corn borer spawned one generation yearly. By the late 1930's, a two-generation per annum European corn borer mushroomed swiftly and soon became dominant in the central Corn Belt. It established itself in Illinois in 1939, Iowa in 1942, Nebraska in 1944, and South Dakota in 1946. Meanwhile, the single-generation European corn borer extended northward into northern Minnesota, North Dakota, and the Canadian provinces of Quebec, Manitoba, and Saskatchewan.

**Counties with
Detection Traps**



The Utah Department of Agriculture and Food (UDAF) in association with the United States Department of Agriculture (USDA), has launched a European corn borer trapping program. This program took place in seven counties throughout Utah. The counties where traps were set are: *Cache, Box Elder, Weber, Davis, Utah, Sevier, Sanpete*, with the greatest majority set in *Emery County*. A total of 147 traps were placed in all. These trapping proceedings began in Mid-June 2005 and ended in Mid-September 2005.

County	# of Traps
Cache	12
Box Elder	12
Weber	12
Davis	12
Utah	6
Sevier	6
Sanpete	6
Emery	81

Action Plan for 2006

UDAF will persist in its trapping program to detect the occurrence of European Corn Borer. Detection information is crucial to agricultural producers so that they may protect their crops from this devastating insect. Approximately 100 traps will be placed in the corn producing areas of the state.

Gypsy Moth Survey & Detection Program

Quarantine Pest

2005 Survey Program

Detection Trapping- In 2005, the cooperating agencies of the Utah gypsy moth detection program placed 2,917 traps in 29 counties. The Risk Class I trapping corridor is located throughout 9 counties and contained 1,625 traps which represents an average density of 8 per square mile. The Risk Class II trapping areas were located in 5 counties and contained 57 traps which represents an average density of 4 per square mile. The Risk Class III trapping areas are located in 26 counties and contained 446 traps which represent an average density of 1 per square mile. The Risk Class S trapping area is located in 1 county that receives a high number of camping and tourist visits every year and consists of 7 traps at a density < than 1 per square mile.

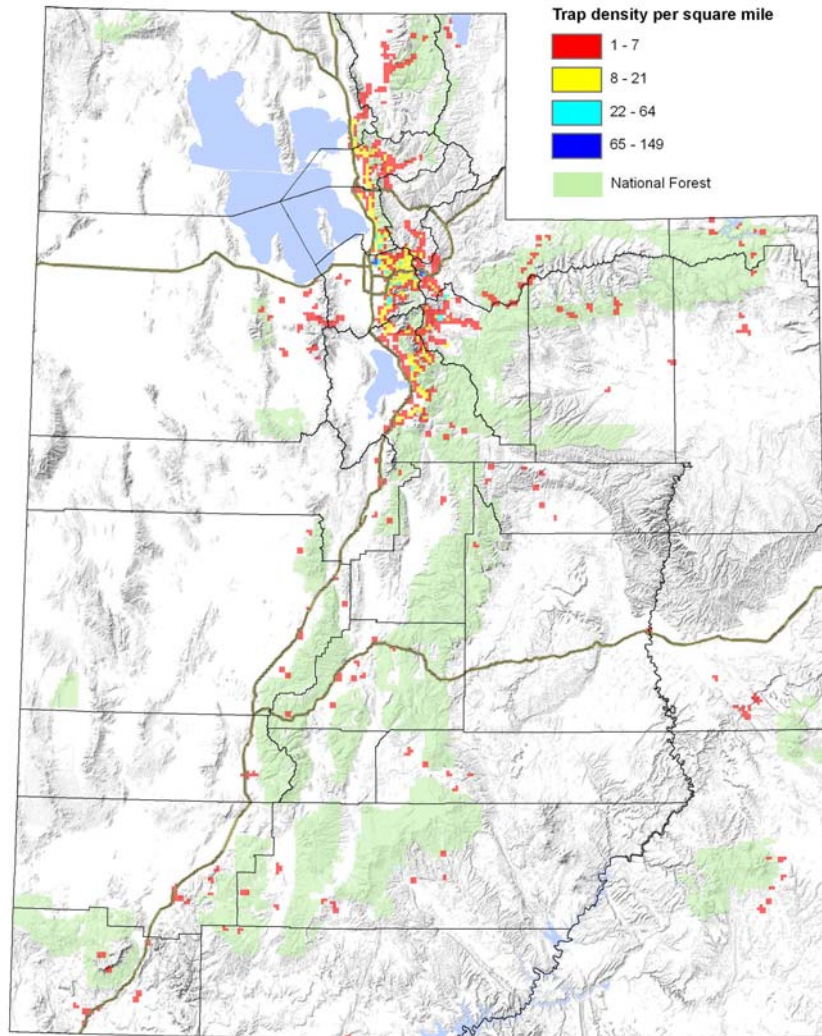
Delimitation Trapping- Delimiting grids were placed at two of the three positive sites from 2004. These delimiting grids were placed in response to Utah Gypsy Moth Trapping and Treatment Guidelines. The decision to forego placement of a delimiting grid at the Mirror Lake positive site (Duchesne County 2004) was based on phenology data that indicated establishment was unlikely based on the elevation of this site. Delimiting grids (500') were placed at the positive site in Salt Lake County (2004) and Summit County (2004). Consistent with the Utah Gypsy Moth Trapping & Treatment Guidelines; we determine the site and only place grids for three years after a single positive catch. Because both of the positive sites for 2004 were in the vicinity of National Forest lands mountain delimiting traps were placed around the two delimiting grids.

Action Plan for 2006

The cooperative gypsy moth survey and detection program in 2006 plans to place 3,500 traps in its detection network, and two 500 foot delimiting grids in response to the three separate single positive catches of 2004 (attachments 1-2). In addition to the detection and delimiting grids, approximately 250 mountain delimiting traps will be placed in the three counties in or adjacent to the delimiting grids. The 2005 positive site occurred within the Pine Brook delimiting grid. The Pine Brook Grid has been expanded to properly monitor this area.

In an effort to keep the Utah cooperative gypsy moth survey and detection program current. Several changes are being considered that will make the program more efficient in monitoring for NAGM and AGM.

2005 Utah Gypsy Moth Trap Density Per Square Mile



Utah Gypsy Moth Historical Table

YEAR	TRAPS PLACED	ACRES SPRAYED	MOTHS CAUGHT
1988	1,737	0	925
1989	5,398	1,190	2,274
1990	7,469	20,064	577
1991	7,818	29,925	192
1992	10,958	15,718	94
1993	10,126	5,135	5
1994	4,035	0	0
1995	1,680	0	0
1996	1,964	0	7
1997	2,954	0	47
1998	4,599	916	32
1999	5,461	764	7
2000	6,905	0	3
2001	5,046	0	1
2002	3,812	0	1
2003	3,534	0	2
2004	3,270	0	3
2005	2,917	0	1

Japanese Beetle Detection Program

Quarantine Pest

2005 Survey Program

The Japanese Beetle (JB) was initially discovered in the U.S. in 1916 near Riverton, New Jersey. Two years later in 1918, the U.S.D.A. & New Jersey authorities undertook efforts to abolish this pest; still, the infestation was so well established that extermination became unattainable. There were no just not adequate monies, or control measures in use at this time. They were inducted into the U.S., from Asia, on nursery stock. In the course of its first 8 years in the U.S., it had bloomed over 2,500 square miles.

Since its induction in 1916, the JB has swept throughout most of the U.S. east of the Mississippi. Because of the potential of artificial spread by aircraft, the JB is a great menace to the agriculture and flora of the Western U.S. The JB is a highly ruinous plant pest causing both plant damage and increased control costs. Adults attack more than 300 species of plants, including corn. Numerous trees, ornamental shrubs & vines, fruits, flowers, other vegetables, garden crops, weeds, and field crops are often damaged too. The grubs are serious pests of lawns, other grasses, and nursery stock. Because of the ease of shipping grubs with nursery stock & soil, this species could potentially be found about anywhere in the U.S. including, Hawaii and Puerto Rico. Adults are highly movable and frequently 'hitch' rides in airplanes and cars. The larvae are dispersed in transported soil and nursery inventory. JB control by biological methods or insecticides is often expensive due to the labor, equipment, and/or insecticides involved.

State plant pest and regulatory officials in uninfested regions are concerned about the induction of JB. To shelter uninfested areas cooperative Federal/ State regulatory programs have been active for about 50 years.

USDA/APHIS-PPQ sustains the Japanese Beetle Quarantine (JBQ) & Regulations that can be found in 7CFR 301.48. The objective of the JBQ is to protect the agriculture of the Western U.S. and ward off the artificial expansion of the JB from the Eastern U.S. The JBQ is explicitly fashioned to reduce artificial spread of JB's by aircraft. The Western states protected by this quarantine are: *Washington, Oregon, Idaho, California, **Utah**, Arizona,* and *Nevada* with *Montana* in the process of being annexed to the list.

Furthermore, Utah has a trapping survey and detection program in place, to eradicate and/or deter the establishment of this destructive insect into the state. In 2005, a total of 484 traps were set in the following counties: *San Juan, Wayne, Grand, Emery, Sevier, Carbon, Uintah, Duchesne, Utah, Salt Lake, Davis, Weber, Rich, Cache, and Box Elder*. Hence, in the summer of 2005, a positive find of (1) JB was collected at the Salt Lake International Airport, in the checked-baggage area. UDAF authorities feel this uninvited guest 'hitched' a ride on the aircraft, from its previous location.

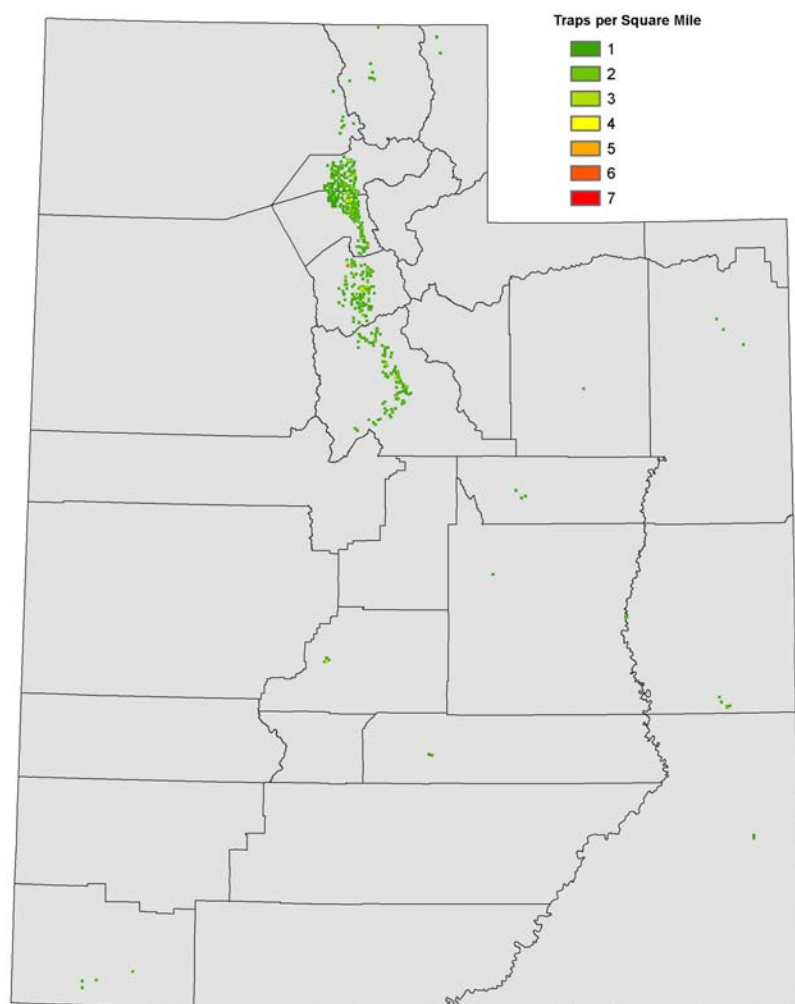
Currently, the most effective means in attracting adults are dual-lure traps, containing both floral & pheromone lures. They are commercially prepared, with sustained-release dispensers, that disperse the pheromone lure for 75 – 100 days. These were the types of traps used this trapping season (2005).

County	# of Traps	
Box Elder	7	
Cache	8	
Carbon	3	
Davis	121	
Duchesne	1	
Emery	1	
Grand	7	
Rich	2	
Salt Lake	116	1 positive
San Juan	2	
Sevier	6	
Uintah	3	
Utah	99	
Washington	4	
Wayne	2	
Weber	99	

Action Plan for 2006

Given these facts, UDAF will continue in its efforts to identify the happenings of Japanese beetle in the state. Discovery tactics are critical to Utah's healthy, \$39 million nursery & floriculture economy.

2005 Japanese Beetle Traps Per Square Mile



Mormon Cricket / Grasshopper Suppression Program

Economic Pest

2005 Program

Grasshoppers and Mormon crickets are members of the native ecosystems of the U.S. They emphasize an important role, serving as food for wildlife and contribute to nutrient cycling on rangelands. There are over 700 various species of grasshoppers in the U.S. However, the two major species affecting croplands are the two striped grasshopper (*M. bivitatus*) and the red legged grasshopper (*M. femurrubrum*). Grasshopper and Mormon cricket outbreaks have the potential to significantly impair Utah's \$315 million forage crop industry, but outbreaks have historically occurred throughout the 17 States that lie on or west of the 100th meridian.

Mormon crickets are a ground dwelling katydid that inhabits the Western Rocky Mountain basins. During outbreaks they create migratory bands that "march" across rangelands. At very high populations they may damage the rangeland, but they are chiefly a pest when they enter and devour croplands.

Often the damage done to agricultural commodities is increased by the effects of drought. Mild winters and hot, dry weather speed up the maturation process of these insects and allow more of them and their eggs to survive the cold. Drought also cuts into the population of birds and rodents that prey on them. Not-to- mention, drought reduces the fungal diseases that generally keep the insects' numbers down.

In the 2005 season, Utah Department of Agriculture and Food in cooperation with USDA/APHIS-PPQ, continued their endeavors to manage the overpowering effects of grasshoppers and Mormon crickets in the state.

(Grasshoppers)

The 2005 survey indicated grasshopper populations to be significantly reduced relative to the past five years. Approximately 25 acres of private property in Cache County were treated.

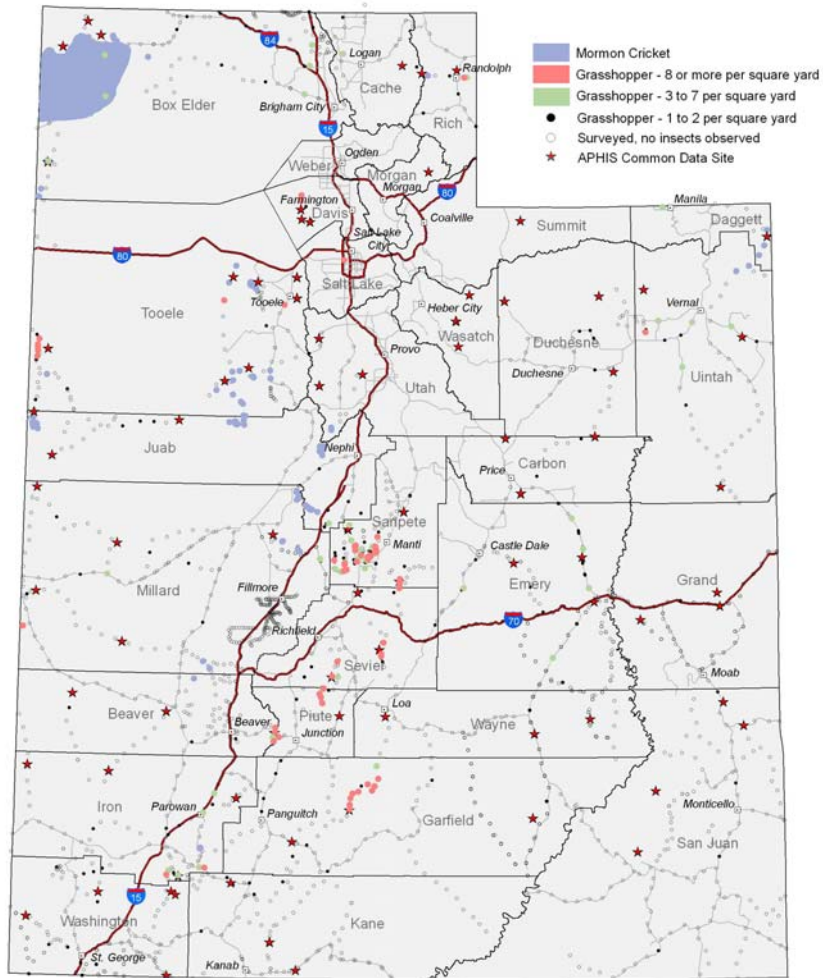
(Mormon crickets)

Mormon cricket populations were significantly reduced relative to the past 5 years. However, Box Elder County experienced an increase in Mormon cricket populations during the 2005 season. Cooperative aerial applications with Dimilin and ground baiting operations were employed to protect local agricultural producers from crop and forage loss. The suppression projects took place mainly in the Grouse Creek Mountains which are located in western Box Elder County. **A total of 90,000 acres were treated to control the effects of Mormon cricket infestation Statewide.**

Action Plan for 2006

UDAF and USDA APHIS will conduct an intensive detection program and prepare to conduct suppression programs if necessary.

State of Utah 2005 Grasshopper and Mormon Cricket Survey



Utah Department of Agriculture and Food GIS September 2005

USDA APHIS PPQ

USDA APHIS PPQ
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Robert King SPHD-UT
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Grasshopper

County

Infested Acreage

	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>
Beaver	50,000	11,000	13,800	4,000	7,000	4,420	5,880
Box Elder	100,000	55,000	120,400	120,000	94,710	6,570	15,200
Cache		19,000	64,500	17,000	2,200	26,380	2,170
Carbon	1,000	12,300	56,100	21,600		2,700	
Daggett		600	4,900		8,530	7,750	1,900
Davis	10,000				2,530		3,010
Duchesne	5,000	1,300	82,400	8,700	70,800	230,190	
Emery	2,500	3,500	10,400	6,400		1,710	12,680
Garfield		6,800	10,900	4,200	52,560	13,780	24,450
Iron	10,000	7,000	5,000	12,300	24,540	26,760	17,140
Juab	20,000	33,000	174,000		21,030	8,060	2,250
Kane	15,000	10,300	1,300		16,710	13,680	7,570
Millard	50,000	52,500	216,800	8,950	6,500	3,590	
Morgan	2,000	19,000	63,100		2,530	25,710	
Piute		21,000	18,200	32,600	40,310	5,990	13,870
Rich			12,400		32,140	68,830	4,000
Salt Lake					2,530		2,530
San Juan		23,000	3,900	2,500			
Sanpete	150,000	157,000	183,500	268,400	142,680	118,920	56,470
Sevier	5,000	58,000	31,000	70,500	78,000	22,870	16,850
Summit		10,000	3,600	2,550	12,630	33,870	
Tooele	55,000	5,700	74,600	161,800	39,000	2,550	16,020
Uintah	5,000	36,000	71,200	53,500	25,750	100,950	12,670
Utah	5,000	29,000	56,400	8,500	15,150	16,440	
Wasatch		3,000	65,600	7,000	17,540	25,250	
Washington	5,000		44,100	7,100	150	2,530	
Wayne		2,000	2,000		10,430		
Weber		17,000					
Total	490,500	593,000	1,390,100	863,900	725,950	769,500	214,660

USDA APHIS PPQ

USDA APHIS PPQ
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Mormon Cricket Infested Acreage

County

	1999	2000	2001	2002	2003	2004	2005
Beaver		6,000	7,000	158,500	226,700	257,850	2,540
Box Elder				108,300	125,900	276,620	499,550
Cache			8,100	4,400	8,400	8,260	
Carbon			33,100	33,100	2,530		
Daggett					4,600	21,450	7,610
Duchesne			83,900	7,000			
Emery			1,150	1,100	50		
Garfield					2,530	1,650	
Iron					7,600	70,790	3,040
Juab	268,000	116,000	502,500	618,900	651,500	680,550	43,160
Millard	50,000	190,000	539,500	536,500	517,800	547,700	19,610
Rich							2,530
Salt Lake							2,530
San Juan	1,000		18,300	14,400		3,920	
Sanpete	3,000				31,760	310	4,380
Sevier	1,000		24,500	85,500	190,200	177,420	1,570
Summit						2,530	
Tooele	430,000	346,000	622,000	749,700	793,500	691,050	49,190
Uintah			48,800	48,900	31,300		5,070
Utah	5,000	500	5,650	74,600	116,200	123,800	3,780
Washington						4,600	
Total	758,000	658,500	1,894,500	2,450,650	2,710,670	2,868,500	644,560

Red Imported Fire Ant Detection Program

Public Health Threat/ Quarantined Pest

2005 Survey Program

The red imported fire ant (RIFA) is both a public health and an economic threat. It is a federally quarantined pest and is not known to occur in Utah.

They were introduced into the U.S. from South America in the 1940's. Their current geographic distribution includes all of the Southern United States and the states of Arizona, Nevada, and California.

Red imported fire ants cause livestock damage, allergic reactions, agricultural and ornamental plant damage, and an increase in the use of pesticides. Economic damage associated with red imported fire ant in the United States exceeds 5 billion dollars.

The Utah Department of Agriculture and Food is approaching the red imported fire ant concern with pit fall trapping, quarantine enforcements, port of entry inspection and public education. In 2005 all program activity was focused in Washington County. A total of 32 pit fall traps were placed in four grids that targeted high risk areas such as; golf courses, nurseries, industrial areas. All specimens were identified to genus and members of the genus *solenopsis* were identified to specie. No imported fire ants were collected in the survey for 2005. Utah is still free from imported fire ant populations.

Action Plan for 2006

Red imported fire ants are a serious threat to Utah's economy. In 2005 UDAF plans to continue its cooperative program of public education, quarantine enforcement and detection trapping. Additional state and federal funds have been applied for through the Cooperative Agricultural Pest Survey (CAPS) Program these monies will be needed to support this program.

**Counties with
Pit Fall Traps**



West Nile Detection Program

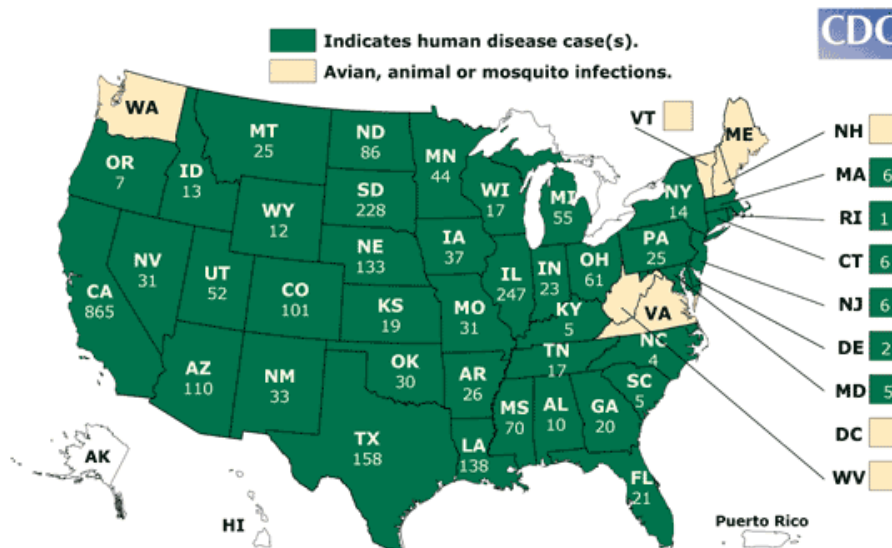
Public Health Threat

2005 Survey Program

West Nile Virus was first detected in the State of Utah during the summer of 2003. This disease again appeared in Utah during the summer of 2005.

West Nile Virus is a disease transmitted by mosquitoes. In Utah, two principal mosquito vectors of West Nile Virus are: 1) *Culex pipiens* (the house mosquito) and 2) *Culex tarsalis* (the marsh mosquito). The major activity period for these disease vectors is from dusk until dawn. Daytime activity is almost non-existent. Birds are the natural hosts of the disease with humans and horses serving as secondary hosts. The majority of people infected with West Nile Virus never develop symptoms. However, a small percentage may develop symptoms such as fever, headache, body aches, etc. A more serious form of the disease can occur when the virus infects the central nervous system.

Mosquito surveillance with additional control efforts were implemented in 2005. The State Legislature provided UDAF with \$329,000 to fund these additional control efforts. Sentinel chicken flocks were increased, surveillance of wild bird populations was increased, additional domestic and wild horses were tested and mosquito abatement was expanded into new areas.



Action Plan for 2006

If funding is again provided, UDAF plans to continue the West Nile Virus Program with an emphasis on increased mosquito control to reduce West Nile Virus as a public health threat. UDAF will also continue to conduct education and outreach on issues concerning West Nile Virus and mosquito abatement programs.